

Comparing RFV to RFQ for Scissors Clip and PEAQ

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During the springs of 2006, 2007, and 2009 Team Forage conducted a study to determine the rate of alfalfa forage quality change during spring growth. In particular, the interest was in the rate of digestible fiber change and the relationship of RFV to RFQ rates of change.

The study consisted of repeated samplings of alfalfa according to the scissors clip procedure at 3 sites in 2006 (Fond du Lac, Grant and Waupaca counties, Wisconsin) from approximately May 15 to June 20, at over a dozen sites across Minnesota and Wisconsin from May 14 to June 11 in 2007 and at a dozen sites in 2009 across Wisconsin from May 5 to June 15. There were a total of 34 samples in 2006, 158 samples in 2007 and 112 samples in 2009. All samples were analyzed at the UW Marshfield Soil and Forage Testing Laboratory. This data is based on NIR analysis that will be verified with in vitro analysis later this year.

The average rates of change of several forage quality components are presented in table 1. Generally the rate of quality change was slightly less in 2006 than 2007 or 2009. It should also be noted that the rate of forage quality change in 2006 was higher within each location than the overall average indicates. So that actual rates of change within a location were more similar among years than the table indicates.

Table 1. Rate (units) of Alfalfa Forage Quality Change per Day, 2006, 2007 and 2009 in Minnesota and Wisconsin.				
Component	2006	2007	2009	Mean
Crude Protein	-0.19	-0.32	-0.23	-0.25
Acid Detergent Fiber	0.30	0.46	0.33	0.36
Neutral Detergent Fiber	0.33	0.56	0.41	0.43
Neutral Detergent Fiber Digestibility	-0.34	-0.45	-0.51	-0.43
RFV	-1.7	-3.9	-3.0	-2.9
RFQ	-2.4	-4.7	.4.1	-3.6

The data for comparison of RFV and RFQ changes are presented in the figures. As expected, there was a high correlation between the two rates of change for each year (0.96, 0.97 and 0.97 for 2006, 2007 and 2009, respectively). Also, as expected, the rate of RFQ change per day was higher than the rate of RFV change per day. This is due to the fact that RFQ rate of change is composed of both the NDF rate of change (which is a responsible for the RFV rate of change) and the fiber digestibility rate of change. Overall the rate of relationship was very consistent with the rate of RFQ change being 1.3 times RFV in 2006, 1.2 times RFV in 2007 and 1.3 times RFV in 2009.

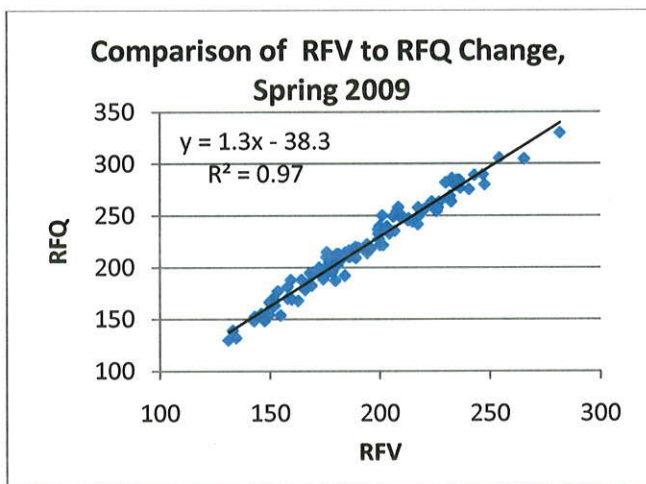
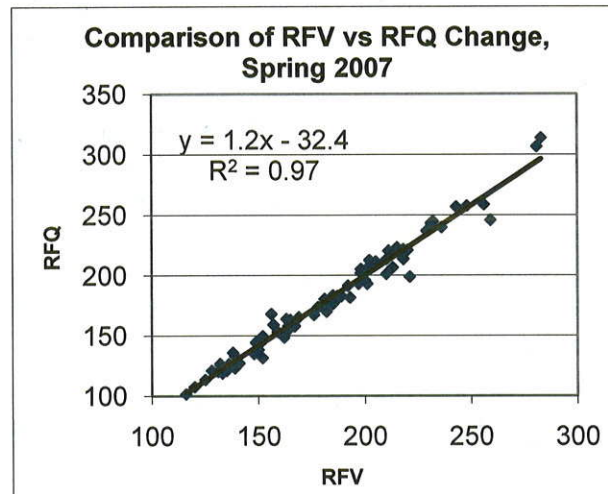
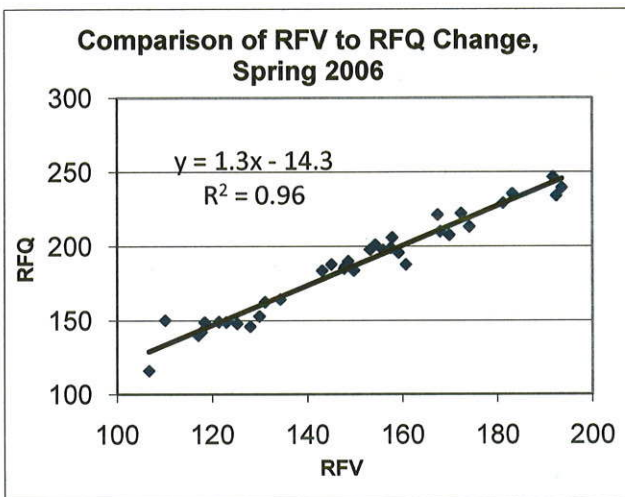
Thus, the major difference among years is the bias (some years RFQ is significantly much higher than RFV compared to other years). So it is important to determine digestible fiber (and RFQ) on one sample in the early spring. To calculate bias from sample analysis results use the formula:

$$Bias = RFQ - (1.3 * RFV)$$

Then, to convert RFV readings (for example, from a forage quality stick) to RFQ, multiply RFV by 1.3 and add bias according to the following:

$$RFQ = (RFV * 1.3) + Bias$$

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It should be noted that this data pertains for first cutting only. Other data suggests that the NDFD rate of change is lower on later cuttings so the relationship of RFV to RFQ rate of change may vary among cuttings during the growing season.